

METASTENASELLUS WIKKIENSIS SP.N., FROM  
WARM-WATER SPRINGS IN NORTH-EASTERN  
NIGERIA (ASELLOTA : ASELLIDAE :  
STENASELLINAE)

By R. J. LINCOLN

INTRODUCTION

THE sub-family Stenasellinae has its centre of distribution in southwestern Europe where it is represented by the genus *Stenasellus* containing about 15 recognised species. It was thought for a long time that the group was restricted to the northern hemisphere, indeed that it did not occur south of the Mediterranean, except for the species *purpurea* described by Monod (1924) from Algeria and placed in the monotypic genus *Johannella*. However, in 1938 Remy described a new species *chappuisi* from a well at Gabu in Guinea, the first indication that the group was to be found in tropical regions with a much wider distribution than was previously realized. Since that time 7 further species have been described: *africanus* from the Ivory Coast (Monod, 1945), *guinensis* from Guinea (Braga, 1950), *congolensis* and *leleupi* (Chappuis, 1951) and *dartevellei* (Chappuis, 1952) from the Congo Basin, and finally from Somalia on the east coast *pardii* (Lanza, 1966) and *costai* (Lanza *et al.*, 1970). All of these tropical species were placed by their authors in the genus *Stenasellus* although it was apparent that those from the western part of Africa differed in a number of ways from the diagnosis of the genus proposed by Racovitza. In 1966 Magniez published a critical review of the status of *Stenasellus* and erected two new genera for the west African species: *Metastenasellus* to contain *congolensis*, *dartevellei* and *leleupi* from the Congo, and *Parastenasellus* for *chappuisi* from Guinea. The remainder of the species were left within *Stenasellus*. Later in the same year Lanza (1966) described new material from near the equator in Somalia and discussed further the taxonomy of the group. In view of the peculiar and apparently primitive conformation of the male copulatory organs of *africanus* a new genus *Magniezia* was proposed for this species, and although the male of *guinensis* was not known at the time it was thought to fit satisfactorily into the new taxon. Thus, the Stenasellinae are represented in central west Africa by three genera: *Parastenasellus* in Guinea, *Magniezia* in Guinea and the Ivory Coast, and *Metastenasellus* in the basin of the Congo. On the eastern side of the continent *Stenasellus* is found in Somalia.

A recent collection of asellids from Nigeria has provided a hitherto undescribed species belonging to the Stenasellinae, the structure of the male copulatory apparatus and other characters showing clear affinities with the congolese genus *Metastenasellus*.

The presence of this genus in Nigeria fits into the general pattern of distribution of asellids in central Africa but it extends considerably the known northerly range of *Metastenasellus* from south of the equator to northern Nigeria.

*Metastenasellus wikkiensis* sp. n.

(Text-figs 1a-c, 2a-d, 3a-e, 4a-e)

**MATERIAL EXAMINED.** 37 ♂ and 12 ♀ specimens collected by C. N. Pearson from Wikki Warm Springs, Yankari Game Reserve, Bauchi Province, North Eastern State, Nigeria. The holotype ♂ reg. no. 1971 : 158, allotype ♀ reg. no. 1971 : 159 and paratypes reg. no. 1971 : 160 are deposited in the collections of the British Museum (Natural History), London.

**DIAGNOSIS.** Body of relatively large size with extremely prominent uropods. In the male the uropod is almost twice the length of the pleotelson, the peduncle being a little shorter than the sub-equal rami. In the female the uropod is relatively shorter; the peduncle is equal to only about half the length of the rami and the complete uropod is about the same length as the pleotelson. Pleopod 1 ♂ without coupling hooks; pleopod 2 ♂, basal article large, endopodite forming a single conical process, slightly twisted apically with circular opening surrounded by ring of small chitinous teeth, exopodite 2-articulate, distal article flat, almost triangular with 3 long setae on outer margin; pleopod 2 ♀ small, triangular, the pair fused proximally, each with 2 strong marginal setae and 2-3 short spines on ventral surface.

**DESCRIPTION.** Length of body excluding uropods 5.0-8.0 mm in the male and 4.0-7.5 mm in the female, width of body at the level of tergite 6 from 0.9-1.4 mm in male and 0.7-1.5 mm in female; colour pale straw, without any traces of pigmentation; body (fig. 1a) more or less rectangular, long and slender, margins fringed with a number of small setae; head short, anterior margin evenly concave, eyes absent; peraeon tergites reaching maximum length at segment 7 and maximum width at 6 or 7; dorsal surface of peraeon with numerous small upright setae, and postero-lateral corners of tergites with conspicuous groups of small spines; the two free pleon tergites sub-equal, about half length of last peraeon tergite and a little narrower; pleotelson with lateral margins weakly concave proximally, posterior margin convex with small median process (in intact specimens the weak concavity of the sides of the pleotelson is somewhat obscured by the underlying pleopod 3 exopodites); appendages, antenna 1 (fig. 3e) small, reaching only a little beyond the end of peduncle antenna 2, article 1 and 2 of peduncle well developed, article 3 small, flagellum slightly longer than peduncle, 8-articulate, distal 6 articles bearing aesthetascs; antenna 2 (fig. 3d) reaching about one-third length of body, peduncle robust with articles increasing in length from 4-6, article 3 with small rudimentary exopodite, flagellum 25-35 articulate (number of articles in flagellum tends to increase with size of the individual); mandible (fig. 2c) with a 3-articulate palp, article 1 with 2 strong spines, article 2 with group of strong plumose setae, terminal article fringed with about 10 plumose setae on inner margin, incisor process and lacinia

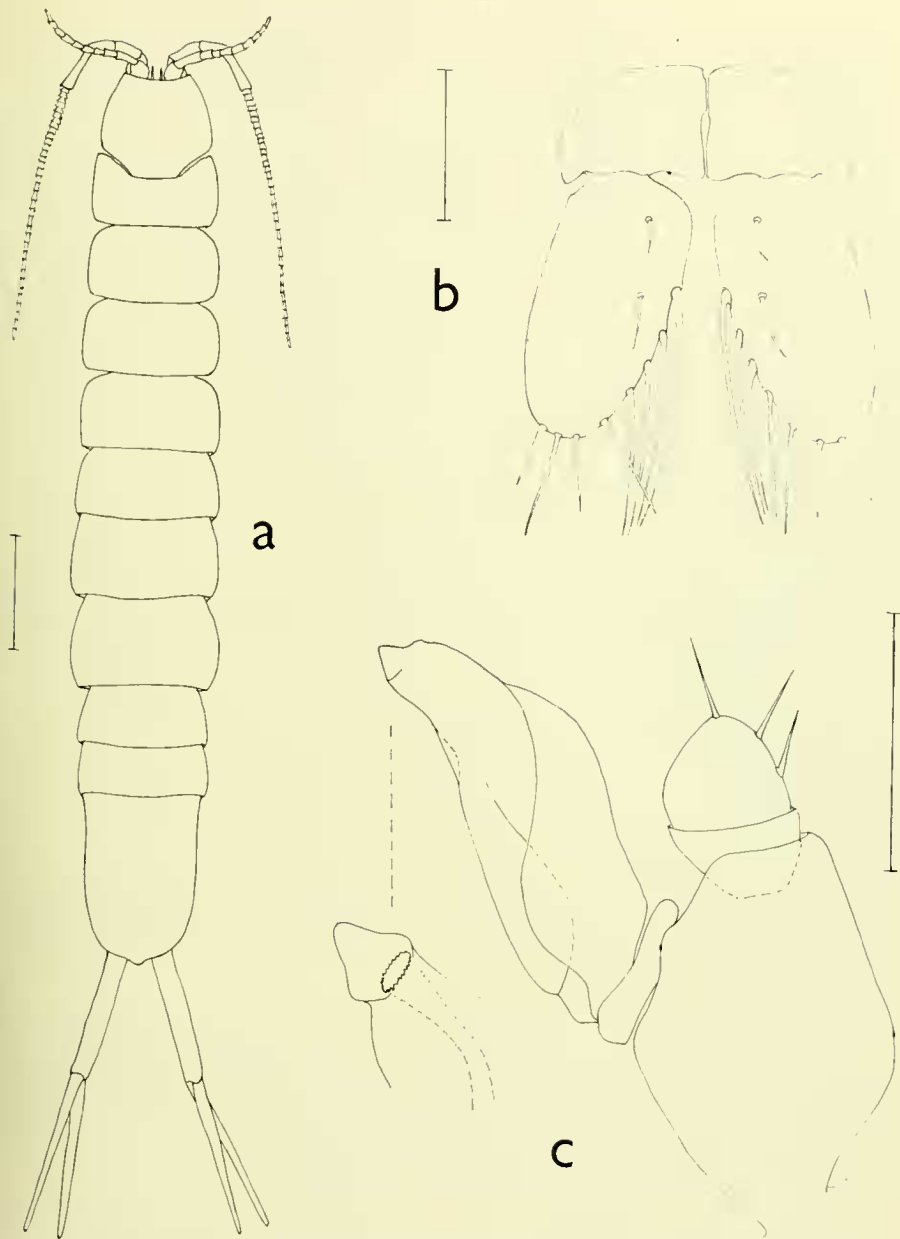


FIG. 1. *Metastenasellus wikkiensis* sp. n. ♂ paratype; a, dorsal body, entire, bar scale 1.0 mm; b, pleopod 1; c, pleopod 2 (apex of endopodite inset); bar scale 0.25 mm.

mobilis each composed of 4 processes, mandibular lobe with about 12 serrate spines and molar process with row of some 10 long setae; maxilla 1 (fig. 2a), outer ramus has 8 serrate spines and inner ramus 4 ciliated spines; maxilla 2 (fig. 2b), outer and middle lobe each with 6 long serrate spines, inner lobe bearing 3 ciliated and 2 non-ciliated spines; maxilliped (fig. 2d) has short inner masticatory lobe carrying 4 terminal ciliated spines, and a pair of coupling hooks on inner margin, palp 5-articulate, articles 2-3 broader than long, all articles with many long setae on inner margin; peraeopod 1 (fig. 3c), ischium and merus short having 1 and 5 stout spines on inner margins respectively, propodus broad proximally, outer margin strongly convex, palm straight with row of 4 stout spines proximally and 6 curved serrate spines distally, dactylus slightly curved, inner margin carrying 5 strong, closely applied, spines; peraeopods 2-7 (fig. 4a), basis broad and oval, merus with very strong apical spine, propodus and dactylus becoming more slender towards the posterior peraeopods and with inner margin strongly spinose, the large apical spine on merus equal to length of propodus in peraeopod 5 and almost so in 6; a pair of penis lobes are present on ventral side of peraeon segment 7 in male, long and slender, directed backwards and towards mid-line; pleopod 1 ♂ (fig. 1b), basal article slightly broader than long, outer margin strongly convex and inner margin without coupling hooks, exopodite twice as long as broad, having 7 setae along inner margin, setae becoming longer proximally, and 2 prominent spines on ventral surface; pleopod 2 ♂ (fig. 1c) basal article broad, endopodite conical and rigidly seated on basal article; pleopod 2 ♀ (fig. 4e) triangular, the pair fused proximally; pleopod 3 (fig. 4b), exopodite twice as long as broad, covering the entire ventral surface of the pleotelson, distal lobe two-thirds length of proximal and with 4 terminal and 4 outer marginal setae, proximal lobe with 8-9 long setae (from the dorsal side these setae give a setose appearance to the margin of the pleotelson), endopodite simple, fleshy, extending slightly beyond the proximal article of the exopodite; pleopod 4 and 5 (figs 4c, d) fleshy, twice as long as broad, exopodite with traces of an oblique suture towards the end, endopodite simple, reaching just beyond the suture line on the exopodite, no marginal setae; uropods (figs 3a, b) very long in large males reaching twice the length of pleotelson, rami sub-equal with tuft of long terminal setae; in smaller males the uropod is relatively shorter, and in all females and the smallest males the uropod is only about equal to the length of the pleotelson with the peduncle half the length of the rami.

**HABITAT NOTES.** The animals were found living amongst tree roots submerged in water; the temperature of the spring water at the time of collection was 33°C. The apparent photophobic response of the animals, which keeps them hidden deep in the matted, partly decayed root vegetation, makes collection quite a laborious process. Although the animals are colourless when preserved in alcohol for a number of weeks, living specimens are a bright pink colour presumably due to a blood pigment. This colouration is characteristic of many asellid species.

**AFFINITIES.** The conformation of the second male pleopod of *wikkiensis* fits well within the concept of the genus *Metastenasellus*; this is characterized particularly by a uni-articulate endopodite forming a single conical copulatory stylet. In

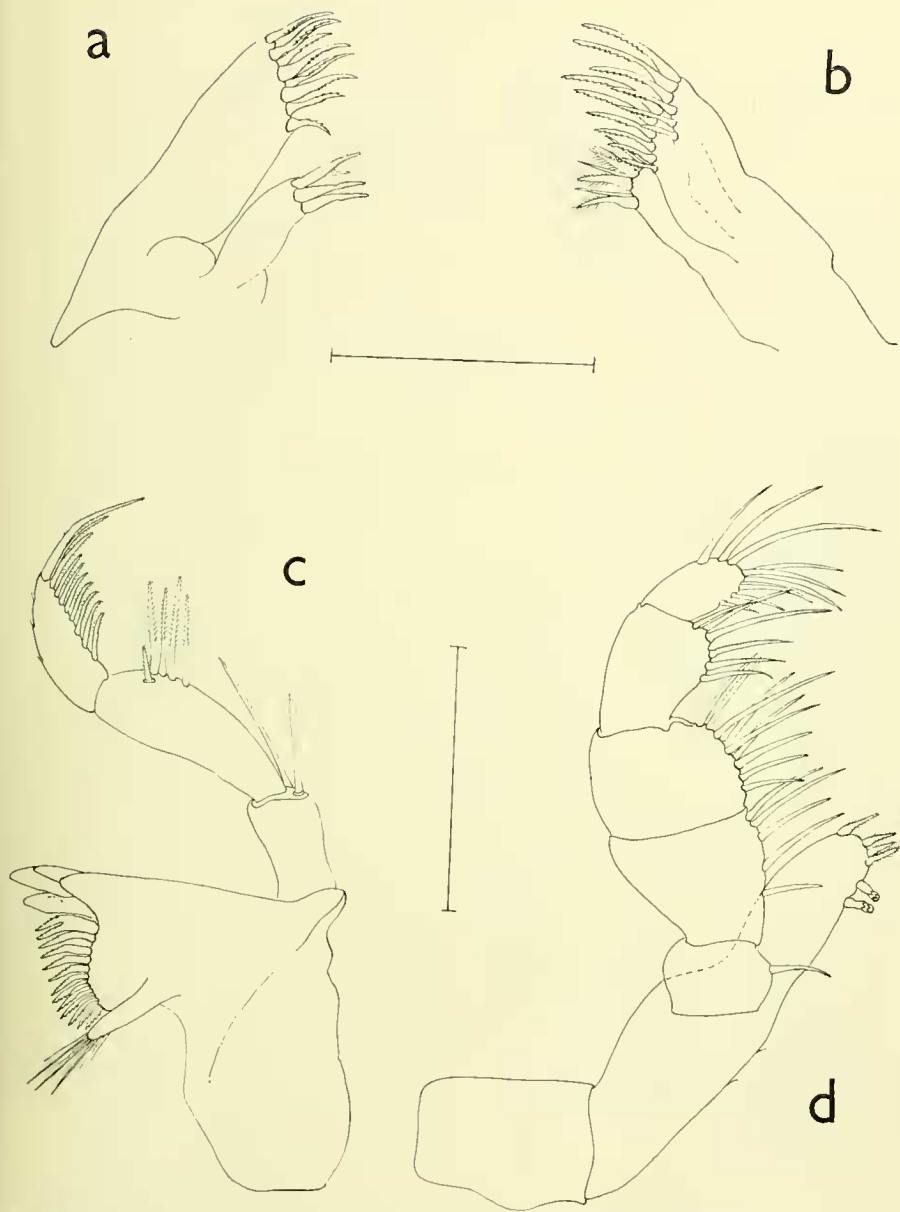


FIG. 2. *Metastenasellus wikkiensis* sp. n. ♂ paratype; a, maxilla 1; b, maxilla 2; c, mandible; d, maxilliped; bar scale 0.25 mm.

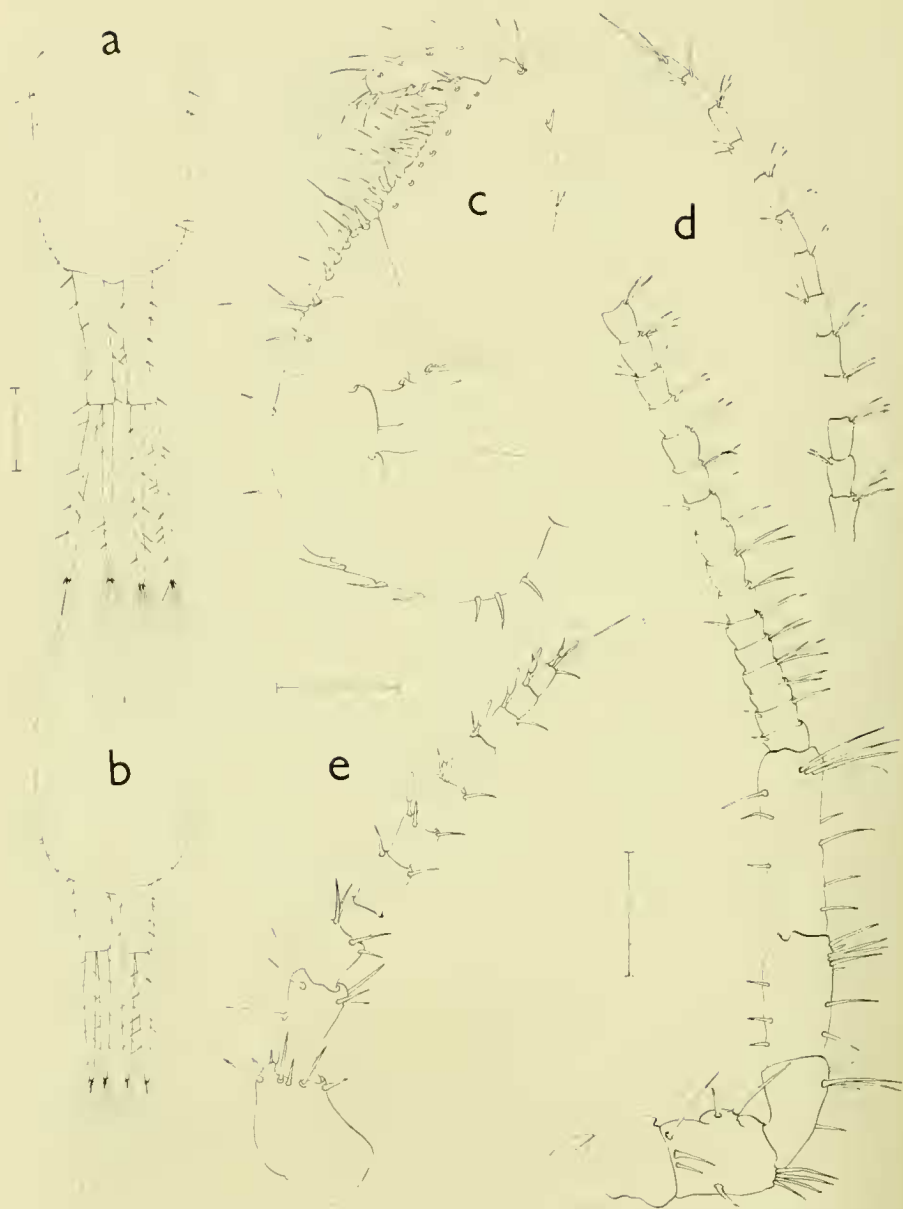


FIG. 3. *Metastenasellus wikkiensis* sp. n. paratypes; a, pleotelson and uropods of large male; b, pleotelson and uropods of large female; bar scale 0.5 mm; c, peraeopod 1 male; d, antenna 2; e, antenna 1; bar scale 0.25 mm.

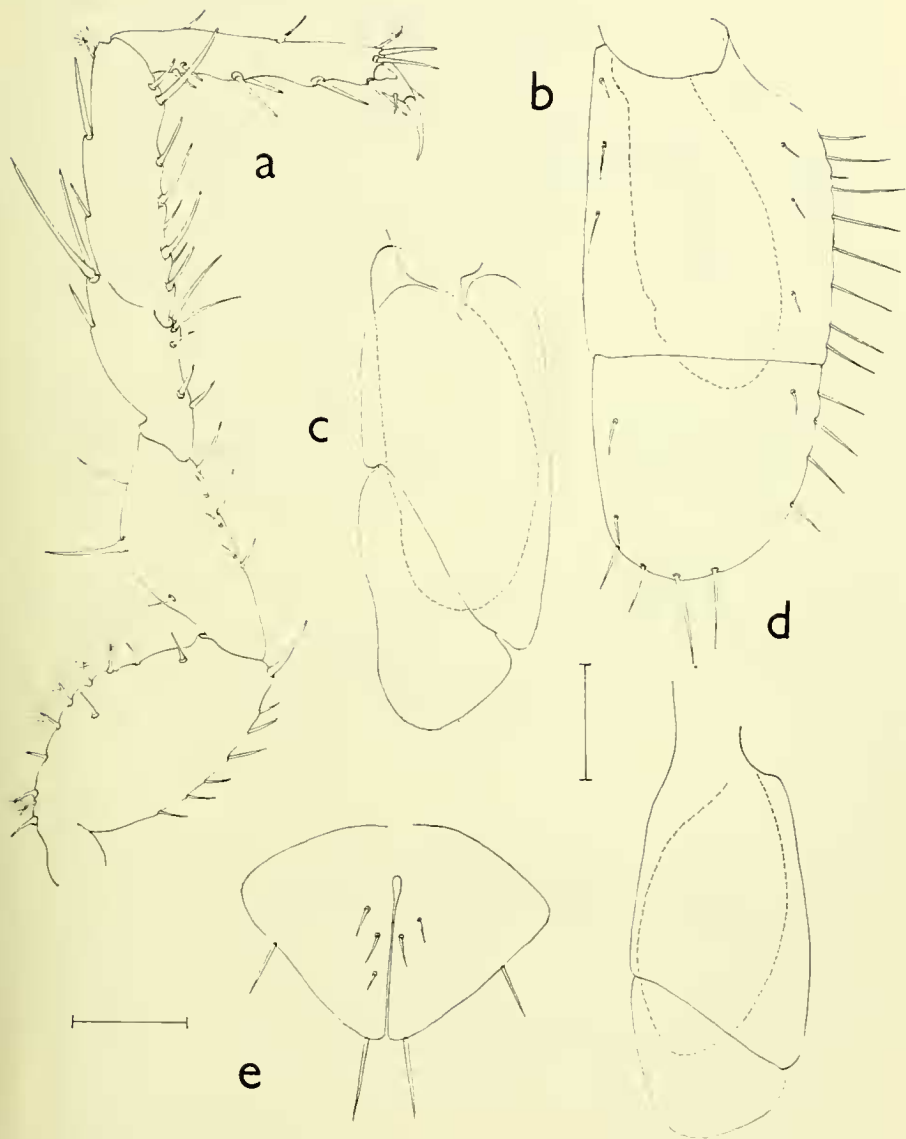


FIG. 4. *Metastenasellus wikkiensis* sp. n. a-d ♂ paratype; a, pereopod 7; b, pleopod 3; c, pleopod 4; d, pleopod 5; e, ♀ paratype, pleopod 2; bar scale 0.25 mm.

the other allied genera this copulatory endopodite is composed of two distinct articles. Although generally compatible with other species of *Metastenasellus*, the detailed structure of the endopodite of the second male pleopod of *wikkiensis* differs on a number of points. In *congolensis* and *dartevellei* the proximal part of the endopodite forms a stout conical process, thickened at its base into a chitinous ring, and spiralling apically to an acute tip. The apex in *congolensis* has a small group of chitinous teeth, and in *dartevellei* these teeth form a long row following the apical spiral. This arrangement differs somewhat in *wikkiensis*; the proximal part of the endopodite is conical and has a thickened ring at the base. (This ring has the appearance of a separate compressed segment but is in fact formed as an expansion of the basal part of the endopodite.) The endopodite has an opening at its base towards the mid line of the animal which results from the rolling up of an otherwise laminate process; the two edges can be seen clearly overlapping along the centre. A flat leaf-like endopodite is considered to be a primitive asellid feature, and is still seen in one species, *africana*; it was this character which led Lanza (1966) to create a new genus *Magniezia* to accommodate *africana*. The apical part of the endopodite of *wikkiensis* is not formed into a strong spiral as in other species of *Metastenasellus*, but is instead only slightly twisted, the tip forming a small triangular lobe adjacent to a circular opening ringed by tiny chitinous teeth. It appears that the rolling up of the endopodite which is responsible for the spiral nature of the apex in *congolensis* and *dartevellei* is much less developed and probably more primitive in *wikkiensis* resulting in a much more open structure.

The other feature of *wikkiensis* by which it is readily distinguished from its close allies is the extremely large size of the uropods. They attain their maximum size in large male individuals where they can be nearly twice the length of the pleotelson, the peduncle being almost equal in length to the rami. In smaller males and in all females the uropods are much shorter and only equal to the length of the pleotelson, and the peduncle is about half as long as the rami. In other *Metastenasellus* the uropods are always shorter than the pleotelson.

#### KEY TO AFRICAN STENASELLINAE

- |   |  |   |   |
|---|--|---|---|
| 1 | Uropods less than one fifth length of pleotelson . . . . .   | <i>Johannella purpurea</i> Monod          |   |
| - | Uropods always more than one fifth length of pleotelson . . . . .  |   | 2 |
| 2 | Pleon tergites 1 and 2 only one quarter length of peraeon tergite 7, partly hidden; pleopod 1 ♂, inner margin of ramus folded onto ventral face . . . . .  | <i>Parastenasellus chappuisi</i> (Remy)   |   |
| - | Pleon tergites 1 and 2 more than half length of peraeon tergite 7, not hidden; pleopod 1 ♂, ramus not folded . . . . .   |   | 3 |
| 3 | Pleopod 2 ♂, endopodite in form of a single conical process; pleopods 2 ♀ fused together proximally along mid-line; basal article pleopod 1 ♂ without coupling hooks . . . . .   | ( <i>Metastenasellus</i> spp.)            | 4 |
| - | Pleopod 2 ♂, endopodite formed of distinct proximal and distal parts with articulation between; pleopods 2 ♀ not fused along mid-line; basal article pleopod 1 ♂ with or without coupling hooks . . . . .  |   | 7 |
| 4 | Pleopod 2 ♂, endopodite swollen proximally and narrow, tubular distally, an internal spiral canal prominent; exopodite with 2/3 marginal setae; pleopod 1 ♂, ramus with parallel sides; pleopod 2 ♀ with 2 marginal setae only; uropods much shorter than pleotelson . . . . . | <i>Metastenasellus leleupi</i> (Chappuis) |   |



- These characters not present . . . . . 5
- 5 Pleopod 2 ♂, endopodite almost rectangular but tapering distally, exopodite with 3 long marginal setae; pleopod 1 ♂, ramus margins convex; pleopod 2 ♀ triangular, 2 marginal setae; uropods in male up to twice length of pleotelson, in female at least as long as pleotelson . . . . . *Metastenasellus wikkiensis* sp.n.
- These characters not present . . . . . 6
- 6 Body size, length up to 14 mm; antenna 1, flagellum 14-18 articulate; pleopod 1 ♂ outer margin of ramus strongly concave; pleopod 2 ♀ with small group of 4/6 terminal setae . . . . . *Metastenasellus congolensis* (Chappuis)
- Body length less than 10 mm; antenna 1, flagellum 7-articulate; pleopod 1 ♂ outer and inner margins strongly convex . . . . . *Metastenasellus dartavellei* (Chappuis)
- 7 Pleopod 2 ♂, distal article of endopodite forming oval, folded lamina; basal article pleopod 1 ♂ without coupling hooks . . . . . (*Magniezia* spp)
- Pleopod 2 ♂, distal article of endopodite narrow and elongate; basal article pleopod 1 ♂ with coupling hooks . . . . . (*Stenasellus* spp.)
- 8 Pleopod 2 ♀ longer than broad, outer margin strongly concave . . . . . *Magniezia africana* (Monod)
- Pleopod 2 ♀ broader than long, more or less triangular . . . . . *Magniezia* (?) *guinensis* (Braga)
- 9 Large body size, up to 20 mm length; uropods equal to length of pleotelson; antenna 2 long and reaching to end of peraeon . . . . . *Stenasellus costai* Lanza
- Small body size, less than 10 mm length; uropods not equal to half length of pleotelson; antenna 2, short, not reaching half length of peraeon . . . . . *Stenasellus pardii* Lanza

## ACKNOWLEDGMENT

I am most grateful to Mr C. N. Pearson of the Department of Biological Sciences, Ahmadu Bello University, Zaria, Nigeria, who collected the material and sent it to me for identification, and subsequently allowed me to retain the specimens for description. He also supplied the notes on the habitat and habits of the animals.

## REFERENCES

- BRAGA, J. M. 1950. Sur deux *Stenasellus* (Crust. Isopoda) de la Guinée Portugaise. *Anais Fac. Ciênc. Porto* **35** (1) : 50-56.
- CHAPPUIS, P. A. 1951. Isopodes et Copépodes cavernicoles. *Revue Zool. Bot. afr.* **44** (4) : 342-359.
- 1952. Un nouveau *Stenasellus* du Congo belge. *Revue Zool. Bot. afr.* **45** (3-4) : 353-357.
- LANZA, B. 1966. *Stenasellus pardii* sp. n. della Somalia e note sistematiche su gli Stenasellinae (Crustacea, Isopoda). *Monitore zool. ital.* **74** : 221-256.
- LANZA, B., CHELAZZI, L. & MESSANA, G. 1970. *Stenasellus costai* sp. n. Isopode freatobio gigante della Somalia. *Monitore zool. ital. (N.S.) Suppl. III* **5** : 133-158.
- MAGNIEZ, G. 1966. Contribution à la systématique des Stenasellinae d'Afrique (Crustacés, Asellotes). *Int. J. Speleol.* **2** : 173-190.
- MONOD, T. 1924. Sur quelques Asellides nouveaux des eaux douces de l'Afrique du Nord. *Bull. Soc. Hist. nat. Afr. N.* **15** : 327-336.
- 1945. Un nouveau *Stenasellus* ouest-africain. *Bull. Inst. fr. Afr. noire* **7** : 101-114.

Dr R. J. LINCOLN  
 Department of Zoology  
 BRITISH MUSEUM (NATURAL HISTORY)  
 CROMWELL ROAD  
 LONDON, SW7 5BD